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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/550,020 | 09/20/2006 | Toshio Goto | 278709US26XPCT | 3818 |
| 22850 | 7590 | 11/20/2008 | EXAMINER | |
| OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. | | | AHMED, SHAMIM | |
| 1940 DUKE STREET | | | ART UNIT | PAPER NUMBER |
| ALEXANDRIA, VA 22314 | | | 1792 | |
| | | | NOTIFICATION DATE | DELIVERY MODE |
| | | | 11/20/2008 | ELECTRONIC |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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| | | | |
|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/550,020 | GOTO ET AL. | |
| | Examiner | Art Unit | |
| | Shamim Ahmed | 1792 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 14 August 2008.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) 6 and 7 is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-5,8-18 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
- Certified copies of the priority documents have been received.
 - Certified copies of the priority documents have been received in Application No. _____.
 - Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application
- 6) Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-5 and 8-14 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 16-17 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The specification does not describe the claimed limitation of having a slit electrode with a gap of 0.1-0.5 mm (claim 16) and also does not describe the plasma is formed through a knife edge type slit electrode of claim 17.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 1-2, 4, 8-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukasa et al (JP2001-237212 A) in view of Spence (6,416,633).

Tsukasa et al disclose a process of surface flattening of a semiconductor device substrate including the step performing plasma processing while supplying liquid chemical such as pure water onto the substrate (see the abstract and the paragraphs 0014, 0015 and 0018 of the translated version of the reference).

Tsukasa et al remain silent regarding the step of applying bias to the material being treated.

However, Spence disclose a plasma treating a substrate at or about an atmosphere of pressure (col.2, liens 17-22), wherein plasma is formed between two electrodes and DC bias voltage is applied to the substrate for

increasing the energy and flux of ions to the substrate (col.1, liens 52-56 and col.12, lines 20-27).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to employ Spence's teaching into Tsukasa et al's treatment process for enhancing the treatment process by increasing the ion flux to the substrate as taught by Spence.

As to claims 8-9 and 11-12, Spence teach the working gas introduced into the electrodes is typically at 250 to 500 torr above atmospheric pressure (col.7, lines 11-13).

As to claim 15, it would have obvious to have the plasma created is non-equilibrium as the plasma discharge is in similar in nature as the claimed invention.

7. Claims 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukasa et al (JP2001-237212 A) in view of Spence (6,416,633) as supported by Okudaira et al (4,705,595).

Modified Tsukasa et al discusses above in the paragraph 6 but fails to explicitly teach that the plasma includes radicals; positive or negative ions based on the plasma are selectively supplied to the substrate.

However, it would have been obvious to include radicals, positive or negative ions in Tsukasa et al's plasma because by definition, plasma includes ions and radicals as supported by Okudaira et al.

Okudaira et al illustrates that an etching process by plasma, it is known that "ions" in plasma and "radicals which are neutral particles, but also are reactive species" usually react with the sample (col.3, lines 65-col.4, lines 5).

As to claim 5, it is obvious that radicals are supplied with high-speed in a plasma etching process as neutral radicals has slow reaction if only neutral radicals are present as suggested by Okudaira et al.

8. Claims 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukasa et al (JP2001-237212 A) in view of Spence (6,416,633) as applied to claims 1-2, 4, 8-15 above, and further in view of Gherardi et al (2002/0037374).

Modified Tsukasa et al discusses above in the paragraph 6 but fails to explicitly teach that the discharge or electrode gap is 0.1-0.5 mm.

However, Gherardi et al illustrate an atmospheric pressure plasma processing and device, wherein the process involving two electrodes between which the article to be treated arranged (paragraph 0048) and the inter electrode gas space is adjustable between 0.5 to 5 mm (paragraph 0050), aforementioned teaching reads on the claimed slit electrode with the claimed gap.

As to claim 17, as the specific knife edge type slit electrode is not defined in the specification. So, Gheradi et al's electrodes are considered to be the claimed ones and this apparatus limitation in a process claim are given a little weight as it has been held that an apparatus limitations, unless they affect the process in a manipulative sense, may have little weight in process claims. In re Tarczy-Hornoch 158 USPQ 141, 150 (CCPA 1968).

9. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukasa et al (JP2001-237212 A) in view of Spence (6,416,633) as applied to claims 1-2, 4, 8-15 above, and further in view of Selitser (6,218,640).

Modified Tsukasa et al discusses above in the paragraph 6 but fails to explicitly teach that the substrate treat is accomplished under a pressure of 760 Torr.

However, Selitser teaches typical high pressure discharges with electron temperature of 0.1 to 1 eV and electron density of 10¹⁴-10¹⁹ cm⁻³, wherein the operating pressure typically near atmospheric pressure (760 Torr). (col.3, lines 24-27).

Therefore, it would have been obvious to one of ordinary skilled in the art at the time of claimed invention to maintain the typical values of the electron temperature and densities as taught by Selitser.

Conclusion

10. The prior art made of record, listed in PYO-892 and not relied upon is considered pertinent to applicant's disclosure.

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shamim Ahmed whose telephone number is (571) 272-1457. The examiner can normally be reached on Tu-Fri (6:00-2:30) Every Monday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine G. Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Shamim Ahmed/

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